Efficiency of ciprofloxacin removal by ozonation process with calcium peroxide from aqueous solutions

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Abstract

Background: Advanced oxidation processes such as catalytic ozonation are efficient for the removal of antibiotics. Calcium peroxide is one of the catalysts that can be used as a source of hydrogen peroxide.

Objective: The aim of this study was to determine the efficiency of ciprofloxacin removal by ozonation process with calcium peroxide from aqueous solutions.

Methods: This experimental study was conducted in Hamadan University of Medical Sciences, 2013. The process consisted of ciprofloxacin with a concentration of 10-100 mg/L, pH=3-11 calcium peroxide with a concentration of 0-0.1 mg/L, 1 gr/min ozone (O_3), and 30 min reaction time in a semiconductor reactor.

Findings: In the optimal condition, at pH 3, calcium peroxide 0.025 mg/L, O_3 1 gr/min, and initial antibiotic concentration of 10 mg/L, 92% of ciprofloxacin was removed and 45% of chemical oxygen demand was reduced.

Conclusion: With regards to the results, the ozonation process with calcium peroxide can be suitable for removal of ciprofloxacin contamination.

Keywords: Ciprofloxacin, Ozone, Calcium Peroxide

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